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Shaping digitalization among German tourism service providers: Processes and implications

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Abstract:
***Purpose**: This study addresses the digital transformation in tourism, accelerated due to the COVID-19 pandemic. By linking the front- and backstage activities, a model of the tourism value system is sketched with the aim to assist the shift toward digital value creation in the case of the German tourism sector by asking, What are the challenges for the digital transformation of tourism service providers, and how can it be promoted along with the tourism value system?*
***Methods**: Recognizing the processual challenges of digitalization, this contribution builds upon a mixed-methods approach. First, a quantitative online survey (n = 372) was conducted by the German Competence Center for Tourism at the beginning of the COVID-19 pandemic. The results were discussed in a workshop with 40 experts from the tourism industry in September 2020, where the COVID-19 pandemic was referred to.*
***Results**: The focus of tourism service providers is predominantly the digitalization of guest communication, whereas corporate strategies on digitalization are widely not available. Key findings of the survey indicate that competitiveness in digitalization will depend on the appropriate infrastructure, clear strategies, and organizational integration.*
***Implications**: The study affirms the increased speed of digital transformation against the backdrop of the COVID-19 pandemic and reveals the need for greater focus on internal processes. In addition, an orchestrated linking of the service providers in a digital ecosystem that is supported by national efforts is proposed.*
Keywords: *Digital transformation, German tourism service providers, digital tools and value creation, digitalization of the tourism value system, knowledge gap*

JEL Classification: *L83, N7, Z30*

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1 INTRODUCTION

The tourism sector is one of the industries worst affected by the COVID-19 pandemic. Destination shutdowns, restrictions, and mobility reduction have forced destinations to find creative solutions (Hall & Seyfi, 2021). The pandemic has accelerated the digital adaptation of the whole tourism industry (Pencarelli, 2020). The need for new digital and interactive incentives in tourism is growing not only due to younger and more technological-savvy and trend-conscious target groups but also due to consumers' increasing

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requirements for quality and service (Komodromos, 2019). Service providers already well-digitized before have had an advantage during the pandemic that has helped them to adapt to and overcome the situation (Almeida et al., 2020).

Digitalization is a paradigm shift in tourism, with the rapid emergence of digital tools and techniques (Buhalis & Amaranggana, 2015). Digital transformation has changed interaction with the consumer in the travel sector and has had an immense effect on the customer journey (Cuomo et al., 2021). On the one hand, this has enabled a change in consumer behavior and led to the need to implement new solutions at every step of the customer journey. On the other hand, technological adaptations can help service providers take advantage of digitalization to strengthen their competitiveness. Therefore, developing long-term digital strategies is crucial for realizing the most effective use of technology to foster digital value creation. Obstacles often occur in the form of lack of IT expertise, time constraints, financial risks, and the strategy itself (Styvén & Wallström, 2017). Practitioners recognize the value of digitalization in terms of efficiency and communication, and it is becoming urgent to use technological advancement for digital value creation (Pohjola et al., 2020). From an entrepreneurial perspective, digital transformation is a human-driven process, which brings a change first in corporate culture to create new experiences and later in processes and business models. Thus, digital value creation is a central objective of the digital transformation (Santarsiero et al., 2021).

The literature reveals a gap in the use of proactive strategies by service providers to meet and respond to consumers' digital requirements. This raises the need to analyze how technological adaptation can facilitate digital transformation in tourism to design the customer journey and strengthen the value impact (Opute et al., 2020). Therefore, digital transformation needs a multi-stakeholder approach, supported by service providers with a long-term digital strategy (Brunetti et al., 2020). Research is already available on the digitalization of the customer journey, in particular in the context of experiences and added value for the consumer (Bec et al., 2019). However, there are gaps in the internal processes of tourism service providers, which can be bridged by leveraging digital technologies to drive the benefits of consumer engagement (Opute et al., 2020).

This paper approaches the research gaps mentioned above and contributes to understanding the digital transformation toward digital value creation in the tourism sector by asking: *What are the challenges for the digital transformation of tourism service providers, and how can it be promoted along with the tourism value system?*

In this respect, a case study on the German tourism industry was conducted, focusing on inbound service providers. Service providers, in this study, comprised hospitality providers, tourism associations, and destination marketing organizations (DMOs). Building upon the generally high awareness for digital value creation, this study aimed to address various digitalization challenges observed in the recovery as well. In this regard, this study corresponds to the demand for empirically testing the digitalization impact in practice (Tanti & Buhalis, 2017) or multi-stakeholder involvement (Brunetti et al., 2020). To meet the complex requirements of digital transformation, a mixed-methods approach (Pelletier & Cloutier, 2019) was implemented in 2020, during the COVID-19 pandemic. The strength of the study lies in the analysis and discussion of quantitative survey results in a negotiated process with a subsequent workshop (Ørngreen & Levinsen, 2017).

2 THEORETICAL BACKGROUND

To explore the implications of digital technology for tourism destinations, the tourism value system is used as a conceptual framework consisting of the concept of the customer journey and the model of value chains. Modeling the value system is a basis for linking the empirical results from the German case study with theoretical insights.

2.1 Digital transformation in the tourism value system

The tourism value system is considered a combination of the value chain and the customer journey. In addition, the model differentiates between front- and backstage (Thees et al. 2020). Value co-creation must be taken into account at both stages. Thus, the service providers should have the ability to align the digital offers with consumer needs (Fragniere et al., 2020). However, the tourism value system is rather complex in function and scale. It comprises individual service providers, management organizations, cities and regions, and even national and international authorities when travel abroad is involved (Thees et al., 2020).

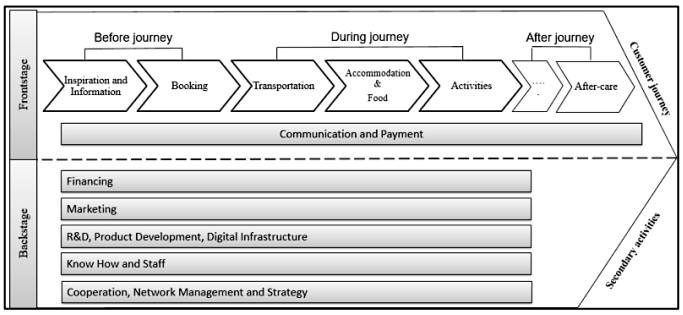
The frontstage includes all customer touchpoints and, specifically, the customer journey, with several steps of experience from the customer's point of view (Stickdorn & Zehrer, 2009). The journey is a result of numerous attractions and involves facilities and services. Thus, the customer journey is linked to different accommodations, mobility, and service providers. To address consumer needs as effectively as possible, digital value creation could occur at any stage: the planning stage, the journey itself, or the post-stage of travel (Lane, 2007; Wang et al., 2014). Consistent digitalization at each step illustrates how the level of immersion within tourism experiences can be increased for travelers along the journey (Bec et al., 2019). Technology adaption enables service providers to create and use new and diversified communications channels, making it easier for consumers to engage (Komodromos, 2019).

Supplementary to the customer journey, the model of value chains (secondary activities) helps analyze the company’s value creation on the backstage (Thees, Erschbamer, & Pechlaner, 2020). Consequently, the classical model of Porter (2000) is adopted as a framework, where the value chain serves as an analytical tool to structure the activities and diversification of a company. Digitalization in tourism has changed the entire value chain in tourism creation, marketing, and distribution (Minghetti & Buhalis, 2010).

Figure 1 represents a complex chain, where bilateral communication and touchpoints between consumers (frontstage) and tourism service providers (backstage) can be guaranteed. The use of digital technologies may increase competitiveness when embedded early in a knowledge-creating strategy. Thus, a digitalization strategy should be more consumer oriented on the frontstage in the short term and less risky on the backstage in the long term (Brunetti et

al., 2020). According to this, digital transformation is not just about fulfilling consumers' requirements. E-Customer Relationship Management (CRM) becomes a strategy to increase consumer satisfaction (Sigala & Christou, 2006).

Figure 1: Value System in Tourism. Source: Own elaboration, according to Thees, Erschbamer, and Pechlaner (2020)



Digital technologies in tourism should not be merely a means to an end or even lead to over-digitalization (Nanchen et al., 2021). It is no longer sufficient to simply determine consumer requirements. The customer journey is exposed to significantly more influencing factors than in the past, and consumer touchpoints have changed (Prahalad & Ramaswamy, 2004). Consumer touchpoints refer to all points of contact between the traveler, the tourism products, the service providers, and tourism stakeholders (Stickdorn & Zehrer, 2009). Digitalization helps to better understand changing consumer requirements and provide more effective customer solutions (Rusu et al., 2020). Therefore, technology can fundamentally change the way to manage tourist flows and experiences (Hughes & Moscardo, 2019). Smart technologies and personal mobile devices provide new touchpoints. Consequently, touchpoints have a multidirectional influence on purchasing decisions and also enable direct interaction (Stare & Križaj, 2018). For interlinking digital and physical distribution channels efficiently, systematic and holistic customer touchpoint management is necessary (Straker et al., 2015).

The challenge in digital transformation is to create a digital ecosystem in which tourism service providers develop a holistic and valuable or smart tourism experience by strengthening personalization, context awareness, and real-time information (Shafiee et al., 2021). A successful digital transformation in companies will depend on the adaptability of tourism service providers, their collaboration partners, and the consumers (Almeida et al., 2020). Therefore, a targeted analysis of the frontstage is critical. This helps to plan budgets and financing on the backstage and to control them on specific distribution channels (Reichstein & Härting, 2018). The more complex the journey, the more potential an analysis offers for identifying interdependencies and optimizing budgets. The findings lead to an increase in effectiveness and efficiency as well as the optimization of budgets (Buhalis & Amaranggana, 2015). Ultimately, this leads to the fact that information and communication technology continuously reconfigure and reorient competitive structures (Pencarelli, 2020). Against the backdrop of the experience society and digitalization, those tourism providers that can be competitive and innovative also co-create authentic, personalized, and technology-supported experiences in conjunction with consumers (Neuburger et al., 2019; Krakover & Corsale, 2021).

2.2 Technological readiness in the tourism value system

Current research shows great diversity in technological readiness, maturity, and technical tools (Ivanov et al., 2021). A multitude of new technological possibilities and applications, but also changes in consumer expectations and behavior, open up new opportunities and challenges (Pencarelli, 2020). On the one hand, digitalization enables the optimization of processes and, thus, more efficient and cost-effective service performance on the frontstage (Reichstein & Härting, 2018). On the other hand, technological adaptation in the company also requires investments, creates new costs, and changes processes and structures on the backstage (Hughes & Moscardo, 2019).

The widespread use of ICT enhances value co-creation within multi-stakeholder ecosystems, increases value for visitors, and facilitates decision making for service providers (Matarazzo et al., 2021). To accelerate digital transformation, several studies have explored value creation in tourism in a digital context (Neuhofer et al., 2014; Opute et al., 2020; Schmidt-Rauch & Schwabe, 2014). To sum up those studies, there is a need to strengthen companies' internal processes, reduce the complexity in managing digital solutions (Opute et al., 2020), and provide communication between consumer and tourism service providers (Reichstein & Härting, 2018). Several constraints and obstacles can occur on digitizing the frontstage. There is a lack of within-budget digitalized products for which a particular technology level is sufficient (Dredge et al., 2019). In addition, computer-based solutions to management issues need to consider the importance of functional benefits and also address privacy and security issues (Hughes & Moscardo, 2019). Digital hubs, community platforms, interactive maps, and further smart solutions in accommodation and transportation could be useful tools in the digitalization of the customer journey (Fragniere et al., 2020). Visitor management and guidance have gained new significance due to the COVID-19 pandemic and call for renewal. Thus, visitor management has become a proactive, sustainable, and holistic instrument, where digitalization can have a supporting function (Høegh-Guldberg et al., 2021).

On the backstage, there are complementary obstacles and constraints. Entrenched in everyday work routines, especially small and medium-sized tourism companies (SME) tend to lack time, digitally trained employees, and the necessary financial resources to dedicate themselves to technological adaption (Dredge et al., 2019). Networks of regional, national, and international open data initiatives will be a critical success factor in maximizing the synergies, relevance, and innovation of an open digital data infrastructure. To realize this vision, coordinated cooperation and trust are essential. Technological adaption requires digital expertise and know-how, relevant information, and a culture of innovation (Fragniere et al., 2020). However, there is often a lack of finance and insufficient technological knowledge (Dredge et al., 2019).

For destinations and their service providers, it is, therefore, necessary to examine the benefits of company-specific digitalization measures and related implications. Destinations need to create a trustworthy, authentic, and

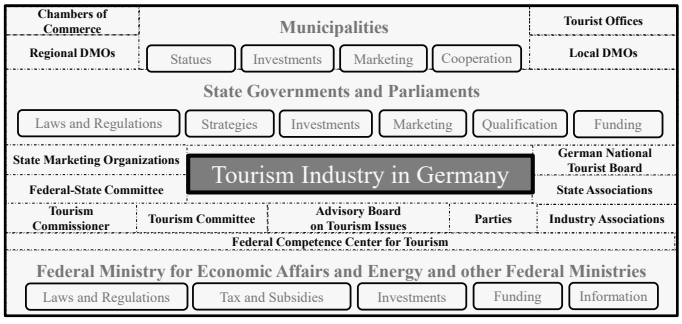
insightful environment to answer any questions digital consumer audiences might have (Buhalis & Amaranggana, 2015). One of the greatest challenges in establishing a shared vision for an open digital data infrastructure relates to leadership issues. With the understanding that a coordinated path for building an open digital data infrastructure will create a common baseline for innovation, service providers can leverage digital opportunities in the future (Pesonen, 2020). This study provides an outlook on where service providers in Germany stand in mastering the digital transformation, which front- and backstage activities in the tourism value system must be considered, and which prerequisites must be implemented.

3 DIGITALIZATION OF GERMAN TOURISM

The tourism industry in Germany is characterized by diverse and extensive offerings: cities and culture, nature and activities, castles and palaces, and experiences and pleasure (German National Tourist Board, 2021). The organization of the tourism industry in Germany is quite complex, with various political actors, policy instruments, and objectives at the federal, state, and municipal levels (Figure 2) (German Tourism Association, 2021b). Thiele and Dembowski (2019) show that tourism in Germany is a cross-sectional task, and discussions include departments such as economy, transport, and environment.

In addition to the funding program "enhancing performance & promoting innovation in the tourism sector" (LIFT) and the so-called Advisory Board on Tourism Issues, a federal competence center for tourism was established in 2018, with the primary goal to support tourism policy of the federal government by generating knowledge and data (Competence Center for Tourism of the German Federal Ministry for Economic Affairs and Energy, 2021a). The federal cabinet initiated a dialogue process for the development of a national tourism strategy in 2019, which includes strengthening digital infrastructure as an operational goal.

Figure 2: Tourism Policy Framework in Germany. Source: Own illustration



Germany is a popular destination, and both foreign and domestic travelers enjoy its offerings. For example, the number of overnight stays has increased in a 10-year comparison from 370 million in 2009 to just under 500 million overnight stays in 2019 (Federal Statistical Office of Germany, 2021). However, in 2020, the COVID-19 pandemic caused a decline, with about 40% fewer overnight stays than in 2019. Commercial sales also fell by around 40%, and there were around 75% fewer passengers at German airports (Federal Association of the German Tourism Industry (BTW) 2021). It is especially due to the COVID-19 pandemic that digitalization has been accelerated, e.g., in technological adaptation, the digitalization of business areas, tourist information as well as leisure activities, visitor guidance, artificial intelligence, open data, online distribution, and mobile payment (German Tourism Association, 2021a). However, only the first steps toward a smart destination have been taken so far (German Tourism Association, 2021a), and the German National Tourist Board, which markets Germany as a tourist destination on an international level, calls for the expansion of a high-performance data infrastructure, increasing the data competence of German tourism since "Germany's online travel market has grown more slowly than some other European countries due to the popularity of offline distribution and the leading role of tour operators" (Phocuswright 2018, p. 7).

The previous challenges illustrate that the SME-dominated tourism industry in Germany is struggling with the digital transformation so far and digital transformation has become more urgent during the COVID-19 pandemic, which will be highlighted next.

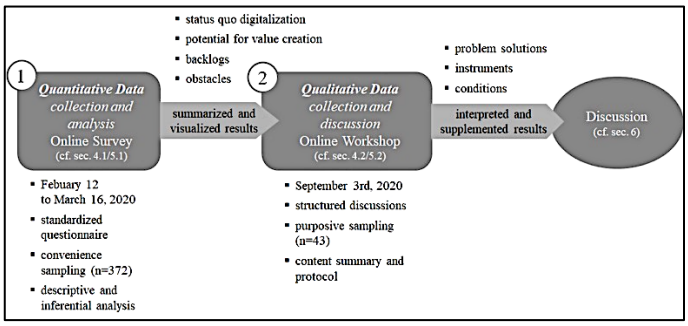
4 RESEARCH METHODOLOGY: MIXED-METHODS APPROACH

Combining the theoretical background and the case-specific challenges, five main hypotheses were developed (Table 1), on the following issues: digital maturity (H1), functional integration of digitalization (H2), digitalization of business divisions (H3), digitalization strategy (H4), and employees' acceptance (H5). This study is based on two data sources as part of the market and trend radar of the Competence Center for Tourism. The center works on behalf of the German Federal Ministry for Economic Affairs and Energy and was established by Project M GmbH. Its primary objective is to facilitate the process of knowledge transfer between politicians, scientists, and travel companies.

The quantitative analyses are based on an online panel of nearly 400 stakeholders from the tourism industry in Germany who have been regularly surveyed on various industry topics since 2018. The stakeholders belong to tourism companies and organizations, the goal being to gather a differentiated view of the German tourism industry. Subjects were acquired from various industry segments with the aim of quota sampling. Since participation was voluntary and thus inconsistent, no quota procedure could be applied. Nevertheless, the nonprobability sample aimed to get the first impression of different perspectives on relevant topics. Results of the online surveys were presented to and discussed with different industry experts in workshops in order to jointly develop options and solutions for designing political framework conditions. This triangulation design was also used for this study to complement and supplement the results of quantitative and qualitative data so that it can be assigned to mixed-methods approaches (Kelle, 2005). This paper illustrates the results of the combination of a quantitative

online survey and its discussion in a qualitative and structured workshop (Figure 3).

Figure 3: Mixed-Methods procedure. Source: Own illustration



4.1 Online survey and recruitment of a nonprobability sample

The online survey covered the areas of digital maturity in order to record the current state of digitalization in German service providers and their value creation; the aim was to shed light on the added value of digital technologies and their application in value creation processes. The digital and analog value creation components were compared and areas in need of support identified. The questionnaire contained 27 predominantly closed questions and was sent to nearly 400 registered panel participants, and an open survey link was also distributed via the Competence Center for Tourism and different multipliers from the tourism industry (e.g., industry associations). This study was based on convenience sampling to reach as many representatives of the industry sector as possible and to get the first insight into the status quo of digitalization from different perspectives. Online surveys have proven their worth for this objective (Evans & Mathur, 2005). In this study, 372 completed and valid questionnaires were collected. The majority of the participants belonged to the segments of hospitality (accommodation and gastronomy) (60%) as well as local, regional, and state destination management organizations (40%). In addition, service providers of leisure and cultural facilities, tour guides, tour operators and travel agencies, mobility services, and consultants were surveyed. The statistical measurement followed a descriptive analysis at first as the frequencies were discussed in the workshops (Section 4.2). Furthermore, hypotheses were developed to uncover differences and peculiarities within the data (Table 1). Inferential analyses were carried out to test selected hypotheses, such as Pearson correlation coefficient. Additional cross-tab statistics were used to interpret the results. The statistical analyses were all performed with the help of IBM SPSS Statistics.

4.2 Structured workshops with Industry Experts

At the online workshop "Digital design: Digital operations and digital paths to the customer" in September 2020, the results of the online survey were presented and discussed in detail to verify key aspects from the experts' perspective. Invitations were sent to association representatives, selected industry experts, and the tourism department of the federal government (purposive sampling, 43 participants). Accordingly, a workshop is understood as a dialogical method that aims to structure a discussion and to share knowledge from different stakeholders (McDonald et al., 2009). Ørngreen and Levinsen (2017) found out that use of workshops as a research method in combination with other empirical approaches is less represented in literature. It is mainly used as a participation tool in local governance and policymaking processes (Bramwell & Sharman, 1999; Thees et al., 2020). In addition to the research function, the Competence Center enables stakeholders in the tourism industry to get indirectly involved in the tourism policy of the federal government by creating a collaborative environment in which interests and needs for action are negotiated. A pre-structured customer journey map was used to facilitate a discussion about digital problem solutions, instruments, and the operational requirements concerning the different stages of the customer journey. The results were presented to all workshop participants in a plenary session. The summarized discussion results of the online workshops were documented and presented to all participants.

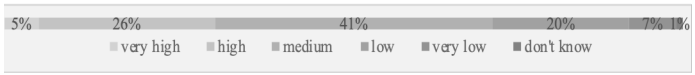
5 FINDINGS: DIGITAL MATURITY AND PATHS FOR DIGITALIZATION

Subsequent findings illustrate the digitalization of service providers in German tourism, with particular reference to five selected hypotheses on digital maturity (Section 5.1) and the tourism value system (Section 5.2). The results were vital to discussing future development in an open workshop (Section 5.3).

5.1 Quantitative survey: Hypotheses on digital maturity

First, the survey participants were asked to assess the degree of digitalization (digital maturity) of their company or organization (Figure 4). The given answers show a Gaussian distribution around an average of 2,99. Only 31% perceived their own degree of digitalization as "high" or "very high" (H1, Table 1), and the rather indecisive answer of "medium" of 41% of the respondents reflects a possible uncertainty regarding coping with digitalization.

Figure 4: Degree of digitalization, How high do you rate the degree of digitalization in your company? n = 372. Source: Own illustration



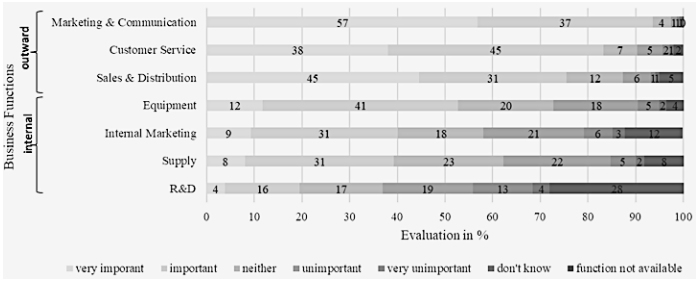
Second, looking at how the service providers organize digitalization, there is a comparatively low integration into the organizational structure. Only a quarter of the companies surveyed had a separate task/functional area for digitalization. It is conspicuous that one in two DMOs had some kind of digital officer, compared to 13% of hospitality providers (accommodation and gastronomy), which confirms significant differences (H2, Table 1).

Third, respondents evaluated the importance of digitalization in relation to particular functional divisions (Figure 5). In this regard, the most important divisions for digitalization were outward-directed (backstage), such as marketing and communication (57% "very important"). Above this, there was a significant difference between DMOs and hospitality providers (H3, Table 1). On the one hand, hospitality

providers rated outward-directed functions even stronger than DMOs, and on the other hand, they did not focus much on internal processes.

Fourth, the quantitative study asked for different measures and directions in the digitalization of the business models. The availability of a digitalization strategy provides a starting point for this discussion, as the respondents were undecided in defining appropriate strategies. However, there are significant positive correlations between a digitalization strategy and the degree of digitalization or integrating technology into the company (H4, Table 1). Beyond the business model perspective, a digitalization strategy correlates with available digital competencies (.507 significance, $p < 0.01$) or receiving and analyzing customer feedback (.462 significance).

Figure 5: Importance of digitalization, What is the importance of digitalization in the following areas of your business? n = 372. Source: Own illustration



Fifth, a positive correlation between the employees' acceptance of digitalization and the integration of technology in the company was confirmed (H5, Table 1). Moving beyond this hypothesis, digital know-how and competencies have a wide-ranging influence, e.g., sufficient digital competence correlates with high acceptance for digital processes (.600 significance) and digital decision and approval processes correlate with the qualification of employees (.548 significance).

There are additional significant correlations above the described hypotheses, for example, between:

- The use of collaboration software for the digitalization of customer contact (.510 significance)
- The use of collaboration software for the use of data management systems (.538 significance)
- The usage of collaboration software for digital decision and approval processes (.522 significance)
- B2B information portals for the digitalization of products and services (.519 significance)
- The renewal of IT structure/software for the optimization of data protection/security (.710 significance)
- The development of a digitalization strategy for online coaching (.513 significance)
- The development of know-how for the optimization of data protection (.713 significance)

5.2 Quantitative survey: Descriptive analysis of the tourism value system

While tourism services follow a detailed customer journey (Section 2), Figure 6 displays key variables from the questionnaire and assigns items to the customer journey and the secondary activities. The majority of the service providers in our study (63% of the respondents) were concerned with the digitalization of customer contact and the introduction of new digital marketing and sales concepts (51%), which reveal activities on the frontstage. Objectives of digitalization projects, similar to the integration of digitalization in businesses, predominantly focus on customers. In our study, 78% pursued the goal of increasing customer satisfaction and customer loyalty, while 76% aimed to ensure competitiveness. Internal objectives, such as renewal of IT structures and software (59%) or making jobs more flexible (29%), were pursued less frequently. Concrete projects were mainly data related but also related to the digitalization of processes, broadband expansion, or introduction of new digital products. Overall, it can be stated that the integration of digitalization follows a predominantly customer- and product-oriented picture, while internal processes provide further potential for digitalization and value creation. Analyzing details of every step of the value system uncovers further findings, e.g., the need to introduce new digital marketing and sales concepts (information). It is important to structure and provide open data or data protection (data management) and accumulate expertise to achieve digital objectives and implement projects (know-how) or develop digitalization strategies (strategy).

Table 1: Main hypotheses and variables

Hypothesis, H_A	Independent Variable	Dependent Variable	Hypothesis Tests
$H1_A$ The majority of the surveyed service providers perceived their degree of digitalization as "high" or even "very high."	50% consent	Degree of digitalization	binomial = sig.
			H_0 retained
$H2_A$ The functional integration of digitalization depends on the type of organization.	Organization type Hospitality, n = 142 DMO, n = 170	Functional integration of digitalization	chi-quadrant = sig.
			H_0 rejected H_A accepted
$H3_A$ Between DMOs and hospitality providers are significant differences in performing outward-facing digitization and digitalization of internal processes.	Organization type Hospitality, n = 134 DMO, n = 166	Outward digitalization (marketing and communication, sales and distribution, customer service)	Hosp.: 1.72 DMO: 1.96 *MU*-test = sig.
			H_0 rejected H_A accepted
		Digitalization of internal processes (equipment, product development, internal marketing, supply, R&D)	Hosp: 3.37 DMO: 2.93 *MU*-test = sig.
			H_0 rejected H_A accepted
$H4_A$ The implementation of a digitalization strategy correlates positively with the digitalization of the business model.	My company has a clearly defined digitization strategy.	Degree of digitization	.534 sig.
		Business model is predominantly based on digital technologies.	.568 sig.
		Business models are continuously digitized.	.614 sig.
		Integration of technology in all areas of the company	.510 sig.
		Adaptation of products/services to digital business models	.499 sig.
			H_0 rejected H_A accepted
$H5_A$ A high acceptance of the employees for digitalization assists in the integration of technology.	High acceptance for digital processes	Continuously digitalized	.507 sig.
		Integration of technology in all areas of the company	.517 sig.
			H_0 rejected H_A accepted

Source: Own illustration, significance level – $p<0.01$

To sum up the survey results, service providers in German tourism are well aware of the future importance of digital value creation. Nevertheless, there is insufficient understanding and know-how of the potential applications and added value of digital technologies, which are predominantly understood as customer- and sales-oriented instruments, while internal applications and requirements are considered to be low in importance (H3). The level of digitalization within companies (H1) is often unclear due to

a lack of expertise in many areas. Concerning future plans of the companies surveyed for 2030 in a post-COVID era, there is a clear trend: the current ratio of digital-to-analog sales of 30% to 70% is to be turned around by 2030, with digital sales then accounting for 70%. This would correspond to an almost

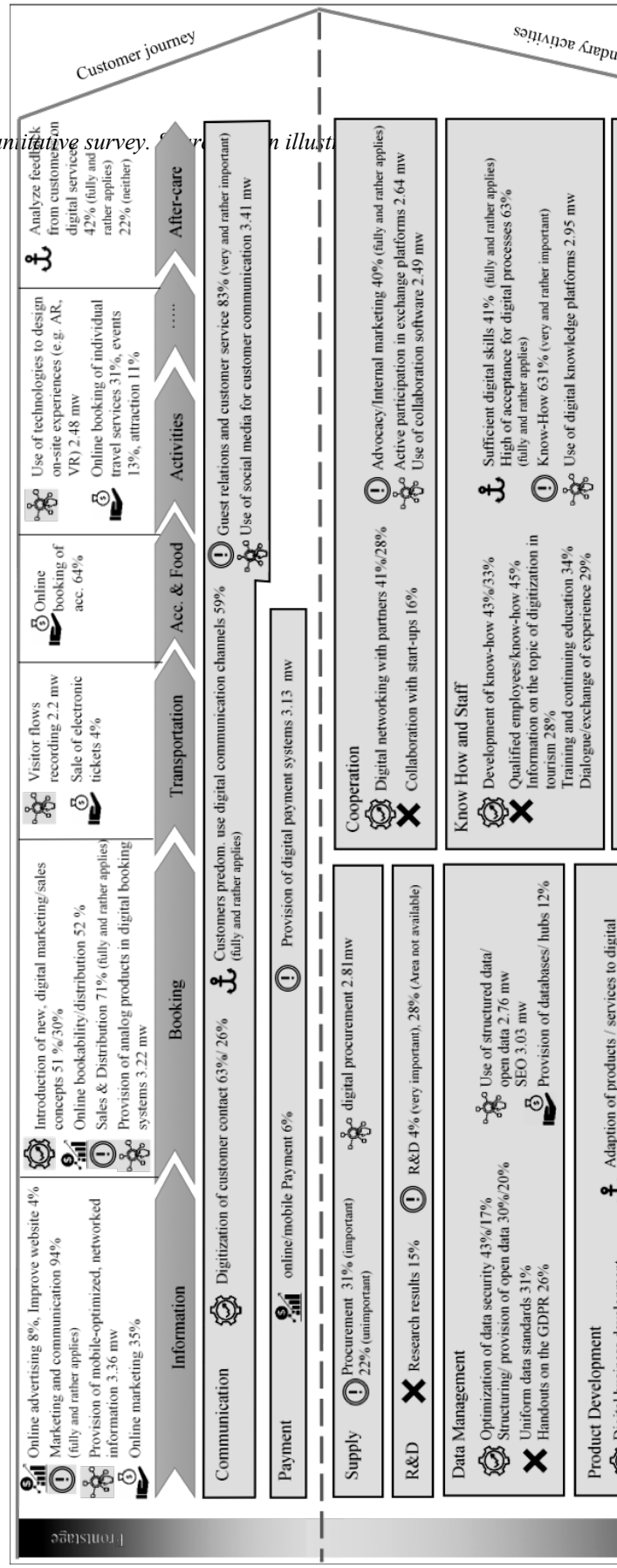


Figure 6: Customer Journey with selected findings from the quantitative survey. [illegible] illustr

133% increase in the digital share of sales. However, it is often uncertain which technologies and applications can be used to achieve this, as the focus is almost exclusively on online bookability.

5.3 Workshops: Problems and solutions for digitalization

These quantitative results built the basis for a workshop with service providers with the aim to discuss problems and solutions in digitalization (Section 3.2). According to various inputs from the workshop sessions, major problems occur in terms of (1) adequate selection of tools and channels, (2) transition and integration of analog and digital data, and (3) further optimization of bookability across the customer journey. During this workshop, these challenges were discussed against the background of the COVID-19 pandemic, as well as existing and future instruments. The COVID-19 pandemic may have emphasized the development of these internal processes. A central instrument that bridges all customer journey stages is the platform in its various settings, especially by linking service providers and communicating with customers efficiently and transparently. In addition, a couple of impulses relate to background processes according to the provided framework in Table 2. The most critical challenges are the provision of know-how, data management, and the need for strategic impulses.

Table 2: Workshop: Design of Digitalization, problems and solutions

Customer Journey					
Communication/ Information	**Distribution/ Booking**	**Transportation**	**Accommodation**	**Activities**	**Aftercare**
• Timeliness of data across all channels • Data availability and security as a basic service • Fit of channel and target group • Integration of new content: VR, 3D hotel, etc. • Providing information frequently • Information overload • Knowledge about information needs • Potential of chatbots • Need for joint platforms	• Occupancy management on different scales and channels • Insufficient customer-centric booking engines, increased individualization • Service providers' tendency to quite DMO booking tools -> growth in booking.com -> loss of contact, know-how transfer more difficult • Technical infrastructure for dynamic booking • Cross-provider cooperation	• Existing guidance systems based on motorists only • Need for flexible systems in excursions • Need for integration of alternative transportation • Support of reliability by digitalization • Need for real-time information on mobility streams	• Stringent implementation of electronic registration forms • Self-check-in/check-out available only in a couple of hotels	• Increased bookability • Realtime information on opening hours and cuing • Monetization • Heterogeneity of services, which makes data complex • Fulfillment of spontaneous needs/customer satisfaction	• Definition of channels and responsibilities • Already high interaction via other business models: FB, Google, etc. • Lack of customer data • Unclear dealing with customer ratings • Reviews, complaints, and loyalty, for which data and management are needed
Secondary Activities					
Data Management			**Know-How**		
• Multi-channel/interfaces, connectivity analog (digital) • Data availability, visibility of offers • Networking of the data pools, also at the organizational level • Digitization of paper data • Different data qualities • Storage of customer data • The need of a platform for each DMO level • Broadband connectivity across the customer journey			• Qualification of small service providers • Interaction between DMO and service providers • Professionalization of DMOs • DMO as a supporter for all SMEs		
			Payments, Identity		
			• Progress in digital identities beyond payment • Understanding money and information flows in destinations and organizations		
Cooperation			**Strategy**		

• Distribution of tasks between the different levels of DMOs
  • Federal DMO: Interfaces and technical prerequisite, knowledge provider
  • Local DMO relationship management, knowledge diffusor
• Startups: Stronger cooperation on a project basis
• Networking of tourism professionals, new collaboration, away from parochial thinking
			• Agile structures
			• Analysis of international best practices and definition of own position and aims in a transparent way
			• Digital maturity, which also includes leadership, knowledge management, and developing products
			• Lack of a decision support platform		

			R&D		
			• Combining big data and own market research to get the big picture		

Source: Own illustration

One important finding of the quantitative survey and the conducted workshop is that digitalization in the tourism industry is accompanied by hopes regarding increased efficiency, better networking, etc. At the same time, a large number of participants are unsettled. The reasons for this include the complexity of legal provisions and regulations (e.g., on data protection) and a lack of know-how. There is a consensus that more collaboration is needed within the industry as a whole. The availability and networking of up-to-date data and reliable information are crucial for the industry's recovery. Comparing the survey and the workshop results, increased awareness of internal processes on the backstage can be observed.

6 DISCUSSION: DIGITAL TRANSFORMATION ON MULTIPLE LEVELS

This discussion builds upon the research question on the digital transformation of service providers in German tourism during the COVID-19 pandemic. The related problem statement (Section 1) can be structured at multiple levels. This discussion approaches research gaps at the service provider level (Section 6.1), in the development of a digital ecosystem at the destination level (Section 6.2), and in the design of context conditions at the national level (Section 6.3). The combination of these three levels corresponds to research recommendations made by Santarsiero et al. (2021).

6.1 Service providers: System integration

Reflecting on the theoretical background (Section 2), digital value creation in tourism is embedded in a complex value system that requires digital transformation at multiple levels across destinations along the customer journey. Digitalization at company levels means digitizing customer interactions or touchpoints on the frontstage and the supporting activities on the backstage (Thees, Erschbamer, & Pechlaner, 2020). However, theory reveals that systemic integration of front- and backstage activities provides further potential for developing digital business models and increasing customer value (Opute et al., 2020).

Against this background, the conducted case study with German tourism service providers (Section 5) uncovers several challenges that prevent digital transformation at the company level. Challenges exist in terms of vague digital maturity or inconsequent organizational integration by a digitalization officer, but more importantly, service providers acknowledge a lack of know-how on implementing digital offers and tools across company divisions. Finally, a strong focus on the digitalization of outward functions can be identified, e.g., customer service, which visualizes positive progress among a significant share of service providers, but the appropriate digitalization of background processes is a challenge for the consequent linking of front- and backstage, e.g., by a system integration through a digital platform.

Commonalities can be identified on linking the theoretical background with case study results. For example, there is strong customer focus in digitalization (Reichstein and Härting 2018) and knowledge gaps (especially for SMEs) (Dredge et al., 2019; Minghetti & Buhalis, 2010). Proceeding with these visible differences, scholars frequently indicate opportunities for digitalization, especially digitalization of business models (Brunetti et al., 2020), while German service providers still seem to struggle with rather general context conditions. These operational challenges are confirmed by the workshop, which stressed not only data availability, connectivity, and quality but also the qualification of DMOs

and service providers as well as the availability of technical infrastructure. However, the awareness that digitalization increases the companies' success requires a new mentality to shape the business model (Brunetti et al., 2020). Further potential lies in a business model development that increases the tourist experience by value co-creation along the customer journey (Cuomo et al., 2021).

This study shows that the courage, speed, and freedom of choice of service providers to deal with the issue of digitalization has reached a new level. Decisions are made significantly faster and have helped to boost technological transformation (Cuomo et al., 2021). However, the digital gaps have become even more visible due to the COVID-19 pandemic and should be minimized. A significant amount of work has been done in the direction of digital communication and product development so far, but internal processes have been neglected. As a result, the link between front- and backstage is often insufficiently developed or, in some cases, completely absent. The frontstage has not been fully digitized either, so digital bookability is often unavailable along the entire service chain, and many processes are still at the beginning of their development. Visitor management and guidance will assume a significant role in the context of digitization and will remain a strategic tool after the COVID-19 pandemic (Høegh-Guldberg et al., 2021). With regard to the possibilities and measures related to visitor management, an increased acceptance on the guests' side can be observed. Guests are looking for digitalization, and service providers are required to address this desire satisfactorily, especially on the frontstage. It is also an opportunity for destinations to make more conscious decisions and to act in a target-group-oriented manner.

Summarizing the discussion at the level of service providers, the case study of Germany contributes to understanding the current pain points from an operational level (including technical infrastructure or access to knowledge) and identifying appropriate solutions that assist in digitalization, including training, information about target groups' digital needs, multi-channel occupancy management, and digital aftercare engagement. A digital mindset is required (Shafiee et al., 2021), which should be balanced with a particular provider's objectives or strengths (e.g., personal contact). Looking ahead, the digitalization of daily processes and provision of data might soon become a basis for the next steps in digitalization, which include tools such as chatbots, assistance robots, and real-time visitor flow management, to name just a few (Gretzel et al., 2021; Ivanov et al., 2021).

6.2 Destination: Digital ecosystem development

The cooperative nature of tourism requires the management of relevant stakeholders across the customer journey (Section 2). This means that the digital maturity of each involved service provider determines and affects the digitalization of the customer journey (Cuomo et al., 2021). A couple of scholars indicate the need for information systems and destination management in digital transformation (Pencarelli, 2020). Here, destinations, especially DMOs, play a strategic leadership role in supporting digital transformation. DMOs are often responsible for disseminating technologies, but collaborative strategies to compete in new value ecosystems are inevitable (Jaziri 2019). Therefore, concepts such as smart destination (Gretzel et al. 2015) and digital ecosystems (Buhalis & Amaranggana, 2015) underline the embeddedness of service providers. These concepts comprise various driving factors, such as the intention to promote cooperation in the sector, to comprise tourism and non-tourism companies, to shape context conditions for digitalization and entrepreneurship, and to provide a joint platform for exchange. Such platforms could visualize inter-systemic or cross-sectoral relationships and assist in knowledge diffusion or innovation development. Digital information systems are still under development in tourism (Baggio & Chiappa, 2013), even if authors from other fields (Brunetti et al., 2020) claim to be tackling digital transformation from a systemic perspective. This systemic perspective includes a corporate culture (Section 6.1) and developing digital culture and skills at the network level (Chatzigeorgiou & Christou, 2020; Brunetti et al., 2020).

This study on the German tourism sector shows first approaches to engage in digital ecosystems. For example, digital networking with partners and internal marketing are assigned moderate importance. The use of collaborative platforms proves significant correlations with the digitalization of customer contact or use of data management systems. In line with theoretical gaps, there is only limited active participation in exchange platforms (Neuburger et al., 2019).

Contributing to the theoretical discussion, this case study uncovers that the preconditions and the digital maturity at the service provider level are often too weak to allow engagement in an exchange on digital issues actively. Improvements are also perceived in collaboration with start-ups (Baggio & Chiappa, 2013) or the provision of uniform data standards. The workshop highlights the need for collaborative platforms at the destination level and consistent data usage. As digitalization is still challenged by knowledge gaps and organization (Neuhofer et al., 2014), the workshop participants declared a consistent distribution of tasks between the different levels of DMOs (local, federal). In sum, progress is highly valued through smaller projects that develop in a bottom-up process. It is a central task of the digital ecosystem to accompany digitalization by the implementation of tools specifically on the backstage. Upcoming applications, e.g., with the use of artificial intelligence, could further simplify deep learning and knowledge diffusion in the ecosystem (Tussyadiah, 2020). Besides the speed of the digital transformation, discussions around the creation of a "level playing field" (Bramwell & Lane, 2010) are increasing. Aligned with the needs of technological progress, fair cooperation and appropriate distribution of value creation will be more than ever essential in the course of the recovery (Fotiadis & Sigala, 2015; Mombeuil & Fotiadis, 2017; Vassiliadis et al., 2013).

Even if the technological capabilities are promising, there is often a lack of human resources and know-how on dealing with digital technologies, e.g., specialized skills in data management and machine-learning-based analytics. Further research needs to address digital (leadership) skills in tourism and the way these skills can affect the digital maturity of service providers (Pesonen 2020). In this regard, a digital ecosystem needs to be built upon the cooperative handling of such challenges. DMOs can provide leadership, but associations and independent consultancies are important entities in this process, which then diversifies the governance

of digitalization in German tourism. A digital ecosystem may change the governance of tourism, as it empowers service providers in self-organization and multi-lateral cooperation besides the focal DMO. Further challenges of a digital ecosystem in practice concern the activity of service providers in this environment and the definition of scope and content. A digital ecosystem is not only dominated by a central platform but also includes various public-available platforms and platforms across different spatial levels and company types, which then require digital culture plus technological knowledge.

6.3 National: Governance of digital context conditions

At the macro level, nationwide associations and governmental agencies have the power to support digital transformation. Brunetti et al. (2020) analyzed the role of public administration at the macroregional level and claimed that public administration should focus on providing digital education, innovative partnerships, and financial resources. In this regard, public administration should serve citizens, businesses, and relevant stakeholders as a partner in digitalization. Especially a detailed national digitalization policy is required to assist in digitalization across spatial and functional levels (Hasenzahl et al., 2019). If successful, this would fill the gap between human-driven digitalization at the level of service providers and the provision of digital ecosystems that require public support policies on infrastructure, data standards, and supply systems (Pencarelli, 2020; Mugobi & Mlozi, 2021).

Although this case study of Germany focused on service providers, implications can be derived from respondents of the national associates and related studies carried out by the National Competence Center. Digitalization in German tourism is certainly affected by the complex organizational structure across spatial scales with partially diverging interests and distribution of tasks. Key development areas in digitalization are innovative and responsible data usage and expansion of a high-performance data infrastructure, which will increase data competence of German tourism (Section 3). The quantitative results illustrate that there is still a lack of context conditions, e.g., in digital infrastructure, education, and financial support. In this regard, this case study highlights the need for governance across multiple levels and thus gives guidance in a coordinated way. Referring to similar cases, governance requires (Pesonen, 2020; Nechoud et al., 2021):

- Structure (digitalization strategy, digital officers)
- Framework conditions (broadband availability, data standards, joint platforms)
- Flexible financing (project oriented)
- Knowledge (information and knowledge platforms, digital competence)
- Inspiration and leadership (providing a role model, underlining chances of digitalization, providing innovation).

7 CONCLUSIONS

In light of the research question "What are the challenges for the digital transformation of tourism service providers, and how can it be promoted along with the tourism value system?" this study investigated the digital maturity of German tourism service providers, as well as processes of digital transformation, using a participative mixed-methods approach. Against this background, four major contributions of this paper can be stated:

1. Underscoring the importance of the holistic digitalization of services by digitizing internal processes in the value system.
2. Identifying the potential of joint digital ecosystems to overcome service providers' obstacles (such as data management and know-how).
3. Identifying the prerequisites for the national governance of digitalization, with special consideration of a digitalization strategy, linking several spatial levels.
4. Defining the effects of the COVID-19 pandemic on digitalization at the service provider level.

It can be concluded that the expansion of time, financial, and human resources for the development of an internal digital environment is particularly important. In addition, workflows and work processes must be reorganized; digital marketing and sales concepts, as well as operational measures, must be developed and expanded; and data analysis (big data, smart data, etc.) must be improved. The expansion of infrastructure (e.g., broadband), the adaptation of data protection, or the further development of funding lines can be further practical implications. The development of a digitalization strategy that follows the corporate strategy and spans various levels (internal and external) is necessary. Overall, a high degree of innovation and cooperation on different levels is required to increase digital value creation in tourism.

Nevertheless, three main limitations need to be addressed for the case study. First, survey results, as well as workshop results, are difficult to generalize for digitalizing all German tourism service providers, as the participants were volunteers probably interested and engaged in digitalization. Second, the survey sample overrepresented the hospitality sector and DMOs, while tourist attractions, tour operators, and travel agencies were hardly represented. In future research, a quota process to capture the status of the entire industry is required, as well as representative comparisons between different segments. Third, this study was subjected to rapid changes during the COVID-19 pandemic. While the online survey was conducted in the early days of the pandemic, the online workshop took place during the pandemic and under an acute need for digital transformation. These dynamics are also illustrated by the result of a recent survey that revives the level of digitalization in a similar setting with a mean value of 3.47. So the current level increased from medium to relatively high during the pandemic (Competence Center for Tourism of the German Federal Ministry for Economic Affairs and Energy, 2021b). Nevertheless, the results offer a first impression of how the tourism industry in Germany deals with challenges of digitalization and where policymakers can take action to provide greater support and to overcome the backlog, especially that revealed during the pandemic. Overall, a high degree of innovation and cooperation on different levels is required to increase digital value creation in tourism. Building upon these limitations, future research may focus on linking service providers in a

digital ecosystem in a systemic approach, defining measures to promote competencies and infrastructure in specific stages of the customer journey, and analyzing the role of national initiatives to shape the important context conditions for digitalization across the tourism industry.

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